NETWORK OPTIMISATION WORK ORDER

in VF-DE-Sharepoint:
https://vodafone.sharepoint.com/sites/radio_engineering/Workoder/Workoder

01.September 2021 NOWO 2018.31_v10updated

☒ RAN 2G ☒ RAN 3G

☒ RAN 4G ☐ Other Topics

Huawei 2G 3G 4G: Layer Management

(this NOWO will replace entirely: NOWO 2016.04 & NOWO 2017.49
and this NOWO will partly replace: NOWO 2014.71, 2014.73, 2015.65, 2016.37 & 2016.56)

1. Aim of the Workorder / Objective

This NOWO aims to:

- Summarize and consolidate the LTE Layers and their basic configurations description from former Workorders within LTE (intra-RAT) as well as towards or from GERAN and UTRAN (inter-RAT)
- describe the central frequency position change of the existing LTE Layer L1800 (DL EARFCN: 1836 → 1801)
- Introduce a new Layer LTE2100 5 MHz due to the refarming of the 3rd Carrier in UMTS2100 (UARFCN=10612)
- Enlarge footprint on LTE800 and LTE2100

Updates in V2:
- Layer LTE2100 10 MHz substitute LTE2100 5 MHz layer (this version was initially only for use in 10MHz refarming scenario)

Update in V3:
- Introduce a new Layer LTE2100 10 MHz due to the refarming of the 2nd and 3rd Carrier in UMTS2100 (UARFCN=10588 and 10612) in addition to existing LTE2100 5 MHz layer in separate locations

Update in V4:
- In order to assign L2100 10 MHz higher priority compared to LTE800 re-shuffling of assigned priorities
- Missing updates on 3G parameters for LTE2100 refarming added

Update in V4.1:
- Some minor corrections and for 2G part missing setting for parameter UTRANPRI in the MO GCELLPRIEUTRANSYS added.

Update in V4.2:
- Layer LTE2100 10 MHz substitute entirely LTE2100 5 MHz layer (deletion of DL EARFCN=125)

Update in V4.3:
- Update RAN Layer Mobility Strategy (4G to 3G Avoidance) and Interfrequency Mobility optimisation *(this NOWO update will replace entirely NOWO 2018.47)*

Update in V5:
- Introduce new Layers LTE700 with 10 MHz and LTE900 with 5 to 10 MHz dynamically.

Update in V6:
Same frequency priority on LTE2600MHz and LTE1800MHz

Update in V7:
- Introduce **new Layer LTE2100 15 MHz** (by move to EARFCN=125) **and LTE2100 20 MHz** (by move to EARFCN=100) as successor of LTE2100 10 MHz in 2021 due to new acquired 5 MHz frequency spectrum block from last auction and entire refarming of total UMTS2100 spectrum after 3G shutdown (UARFCN=10564, 10588 and 10612).
  In addition, some minor mobility parameter optimisations are in included to extend 4G coverage and thus improve customer experience in increasing time on LTE.

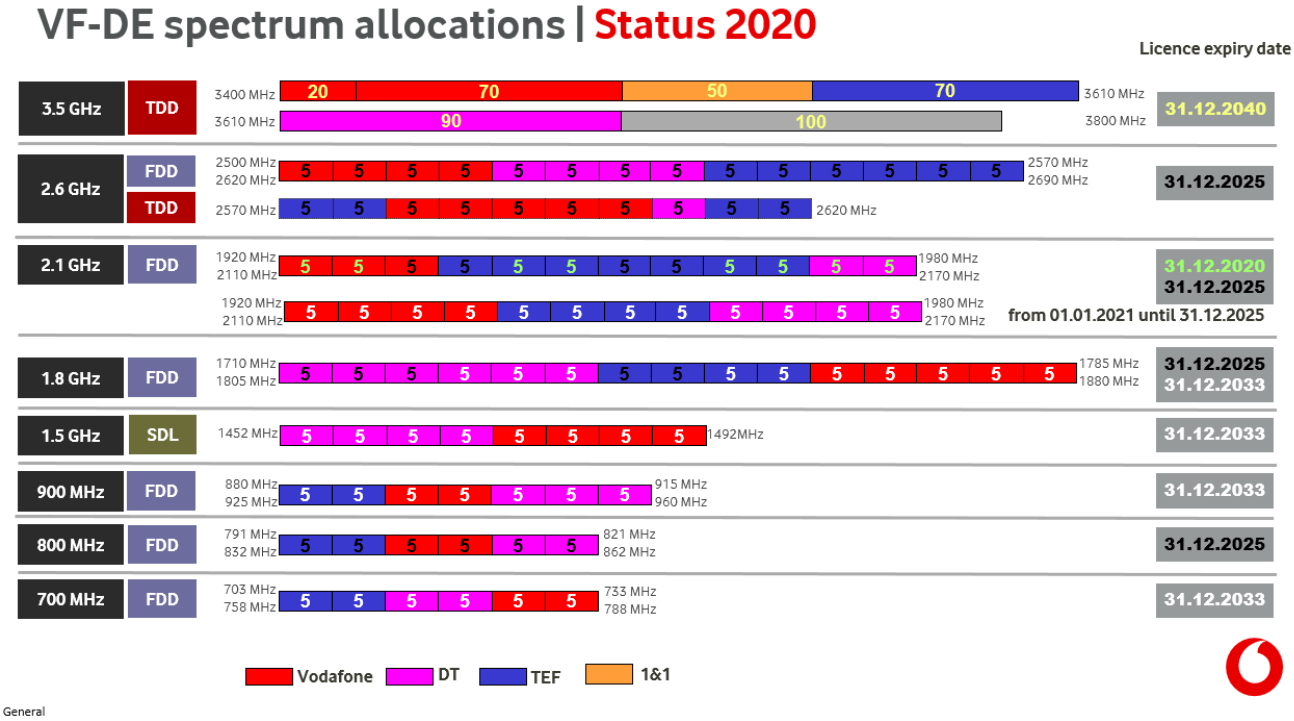
Update in V8:
- Mobility strategy priority will be changed: LTE2100MHz (15MHz/20MHz) layer will have the highest layer priority.
- Additional parameters where changed in order to improve the LTE2100MHz (only for 15MHz bandwidth).

Update in V9 MLB Frequency Priority was changed, Inter-RAT A2(QCI2-6) was changed BlindHO A1A2 RSRP trigger threshold was changed as well.

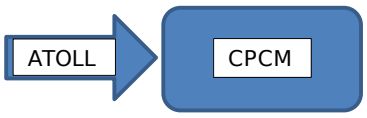
- Update_v10: SRVCC Thresholds modified (only on High Speed Scenario) & IF HO Thresholds modified only on Voice and only on LTE2100 (IF HO from LTE2100 will be triggered earlier in order to improve the voice performance by maintaining the call in LTE)

2. Description

Vodafone D2 has the following licensed LTE frequencies and bandwidths:



The planning data are configured in Atoll and transferred to CPCM radio configuration tool as follows:

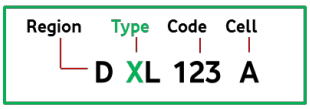


CPCM - Frequ Name	CHANNEL WIDTH	EARFCN DL	EARFCN UL	DL Frequ (center)	UL Frequ (center)	BAND	Comments
LTE 800 D2 10 1	10	6300	24300	806	847	20	No Change
LTE 700 D2 10 1	10	9460	27460	783	728	28	v5
LTE 900 D2 10 1	10	3600	21600	940	895	8	v5
LTE 900 D2 5 1	5	3600	21600	940	895	8	exemption
LTE 1800 D2 20 1	20	1801	19801	1865,1	1770,1	3	No Change
LTE 1800 D2 5 1	5	1924	19924	1877,4	1782,4	3	Only trial
LTE 2100 D2 5 1	5	125	18125	2122,5	1932,5	1	No more used
LTE 2100 D2 10 1	10	101	18101	2120,1	1930,1	1	until Jan'21 (to be

							disused)
LTE 2100 D2 15 125	**15**	**125**	**18125**	**2122,5**	**1932,5**	**1**	**v7 until end July'21**
LTE 2100 D2 10 125	**10**	**125**	**18125**	**2122,5**	**1932,5**	**1**	**v7 *) until end July'21**
LTE 2100 D2 20 100	**20**	**100**	**18100**	**2120**	**1930**	**1**	**v7 from Aug'21**
LTE 2600 D2 20 1	**20**	**2850**	**20850**	**2630**	**2510**	**7**	**No Change**

***)** reduced bandwidth for sites with limited STOB and no low band frequency that do not allow Reference Symbol Power reduction

3. Naming Convention of LTE Cells



Frequency Band	Cell
800 FDD	A, B, C, D, L, M
2600 FDD	E, F, G, N, O, P
1800 FDD 1. Carrier	H, I, K, Q, R, S
2100 FDD	T, U, V, W, X, Y

FBand	700	900	800 > 6 cells	2600 > 6 cells	1800 > 6 cells	1800	2100 > 6 cells	800	2600	700	1400	3500
Techn.	NBIoT	FDD	FDD	FDD	FDD	FDD	FDD	NBIoT	TDD	FDD	FDD	TDD
Carrier					1. Carrier	2. Carrier		1. Carrier				
Type	EL	GL	JL	IL	KL	LL	ML	NL	OL	PL	QL	RL

Source: Identification of LTE-Radio-Cells Einführung des neuen Schemas & Ende zu Ende Test (Vodafone - TTIF)

4. Updates in LTE1800

New LTE cells were built in the past in band 3 (LTE-1800 MHz) like this:

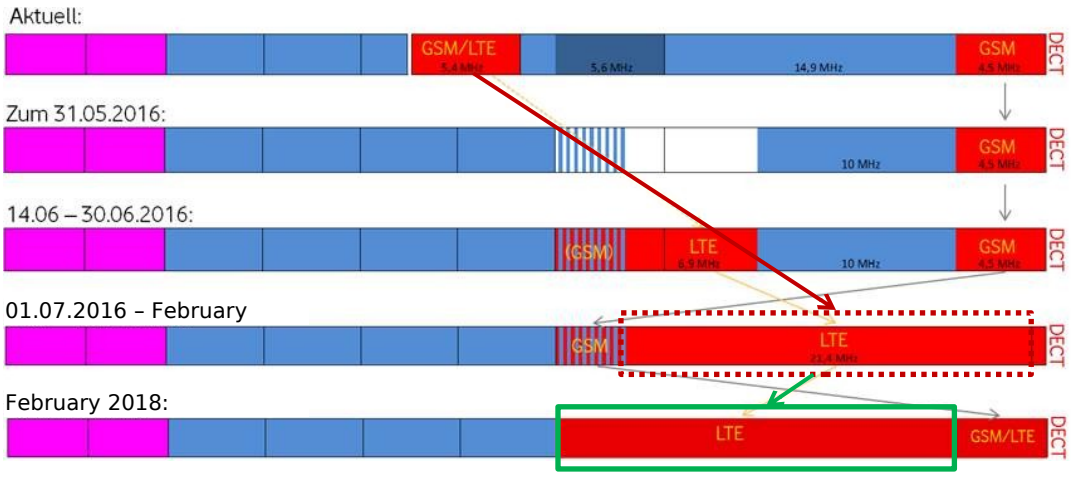
- In a first step (LTE-1800 Fast Track) the used bandwidth was 5 MHz, refarming from existing GSM spectrum.
- In a further step the bandwidth was reconfigured to 20 MHz. (from 01.07.2016 onwards).
- In order to use the available LTE1800 spectrum more efficiently the 20 MHz need to be moved now once again to new downlink EARFCN 1801.

All appropriate neighbour relations have to be configured accordingly in legacy 2G, 3G & 4G cells in order to enable inter cell mobility and IRAT interworking (idle mode re-selection, PS Handover and redirection, CSFB and SRVCC).

The graph below illustrates the steps:

Update July 2016:
EARFCN have to be changed during follow-up time period (01.07 – up to February 2018) from:
DL: 1654 → **1836** UL: 19654 → **19836**

Update April 2018:
EARFCN have to be changed from:
DL: 1836 → **1801** UL: 19836 → **19801**



5. Introduction of LTE2100

In a first step the used bandwidth for LTE2100 was only using 5 MHz from existing UMTS spectrum (UTRAN 3rd frequency carrier) and was limited to those sites selected for the LTE-2100 re-farming. This new LTE-2100 frequency layer and appropriate neighbour relations had to be configured in legacy 2G, 3G & 4G cells in order to enable inter cell mobility and IRAT interworking (idle mode re-selection, PS Handover and redirection, CSFB and SRVCC).

On the corresponding re-farming sites and some further UMTS sites of a predefined buffer zone the 3G cells of the 3rd carrier (UARFCN=10612) need to be deactivated.

In a second step the used bandwidth for LTE2100 was increased to 10 MHz due to the refarming of the 2nd and 3rd Carrier in UMTS2100 (UARFCN=10588 and 10612).

Accordingly definition of LTE-2100 layer with EARFCN = 101 with priority 5 as listed below.

On the corresponding re-farming sites and some further UMTS sites of a predefined buffer zone the 3G cells of the 3rd & 2nd carrier (UARFCN=10612, 10588) need to be deactivated to avoid interference with LTE2100 10 MHz.

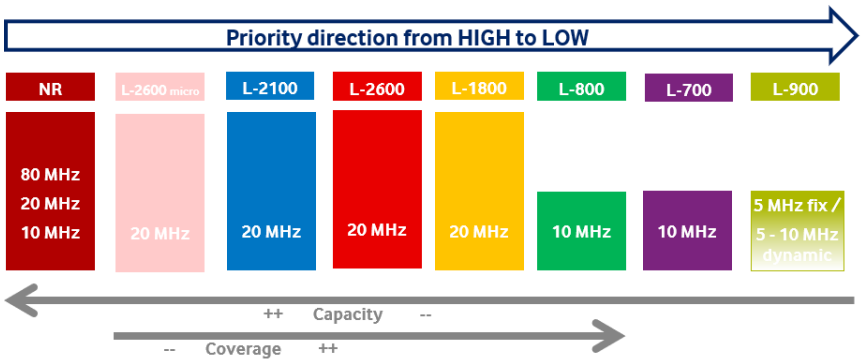
➔ In January 2021 LTE2100 10 MHz (EARFCN=101) will be replaced by LTE2100 10/15 MHz (EARFCN=125)

➔ In July 2021 LTE2100 10/15 MHz (EARFCN=125) will be replaced by LTE2100 15/20 MHz (EARFCN=100)

->Update: no 15MHz in Huawei

Principles of RAN Layer Management

RAN Layer Management Principles – evolution 2021



- ❑ Priority related to bandwidth (throughput & capacity) & coverage footprint (frequency –layer)
- ❑ Lower priority on LTE layers L-1800 & L-700 compared with others of same bandwidth due to configuration as DSS layers with NR usage

RAN Layer Strategy - Status: July 2021
C2 General
12
2021-07-23

Idle Mode Priorities update_v8

Update of priorities as listed below consistently for all radio access technologies. The mobility strategy was changed with the introduction of LTE2100MHz (15MHz) which became the the layer with highest mobility priority.

Neighbour cell priority – evolution 2021 *(mid 2021)*

- LTE-2100 with 20 MHz
- 3G shutdown

Target CELL Priority (Ncell)	Source Technology (Scell)		
	LTE	UMTS (E/// | Hua)	GSM (E/// | Hua)
LTE-2600 TDD/FDD	6	5	6 | 7
LTE-1800	6	6	6 | 6
LTE-2100	5	4	6 | 5
LTE-700	4	3	6 | 4
LTE-800	3	7	6 | 3
LTE-900, 1800-5 MHz	2	2	6 | 2
UMTS F1	1	1	1
GSM900	0	not used	0

Target CELL Priority (Ncell)	Source Technology (Scell)		
	NR	LTE	GSM (E/// | Hua)
NR-3500	7	7	6 | 7 ?
NR DSS 1800	6	7	
NR DSS 700	5	7	
LTE-2600 TDD/FDD_micro		6	6 | 6
LTE-2100	4	5	6 | 5
LTE-1800/2600FDD_macro		4	6 | 4
LTE-800	3	3	6 | 3
LTE-700	2	2	6 | 2
LTE-900	1	1	6 | 1
GSM900	0	0	0

RAN Layer Strategy - Status: December 2020
C2 General
6
2020-07-20

Related parameter for idle- & connected mode in 2G, 3G, LTE-800, LTE-1800 & LTE-2600 cells have to be defined as described in parameter tables below.

Note: in current version of NOWO, frequencies L-700, TDD 2.6 and L-900 are considered but these layers will be configured only where needed and not as network wide neighbour relation settings.

Following mobility procedures will be possible by introduction of the appropriate neighbour relations:

Neighbour Relations **Matrix**

from \ to	LTE 2600 TDD	LTE 2600	LTE 2100	LTE 1800	LTE 1800 @5MHz	LTE 1400 SDL	LTE 900	LTE 800	LTE 700	UMTS F1	UMTS F2	GSM 900
LTE2600 TDD	m	p	p	p	n	n	p	p	p	m	n	m
LTE 2600	p	m	m	m	n	p	p	m	p	m	n	m
LTE 2100	p	m	m	m	n	p	p	m	p	m	n	m
LTE 1800	p	m	m	m	p	p	p	m	p	m	n	m
LTE 1800 @5MHz	n	n	n	p	m	n	n	n	n	n	n	n
LTE 1400 SDL	n	p	p	p	n	m	p	p	p	n	n	n
LTE 900	p	p	p	p	n	p	m	p	p	m	n	m
LTE 800	p	m	m	m	n	p	p	m	p	m	n	m
LTE 700	p	m	m	m	n	p	p	m	m	m	n	m
UMTS F1	p	m	m	m	n	n	p	m	p	m	m	m
UMTS F2	p	m	m	m	n	n	p	m	p	m	m	m
GSM 900	p	m	m	m	n	n	p	m	p	m	n	m

m = mandatory relation network wide | p = planned relation where needed | n = no relation

LTE Idle Mode Thresholds - Intra RAT re-selection baseline (normal cells)

- Basic principle - push UE to higher layers
- different settings per layer (coverage extension and 2G avoidance for L-800 / L-700 / L-900 & L-2100)

Re-selection to lower priority:

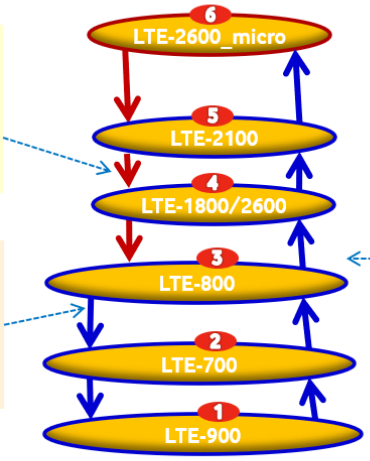
$RSRP_s$ < -120 dBm
$threshServingLow_s$ (6 dB) + $qRxLevMin_s$ (-126 dBm)

$RSRP_n$ > -114 dBm
$threshXLow_n$ (**12** dB) + $qRxLevMin_n$ (-126 dBm)

Re-selection to lower priority:

$RSRP_s$ < -124 dBm
$threshServingLow_s$ (**2** dB) + $qRxLevMin_s$ (-126 dBm)

$RSRP_n$ > -116 dBm
$threshXLow_n$ (**10** dB) + $qRxLevMin_n$ (-126 dBm)



Re-selection to higher priority:

$RSRP_n$ > -116 dBm
$threshXHigh_n$ (**10** dB) + $qRxLevMin_n$ (-126 dBm

coverage extension L-800 / L-700 / L-900 (& L-2100 only site)

x ... idle mode priority

The following pictures should be updated

LTE Idle Mode Threshold - Inter RAT re-selection

Re-selection from LTE to UMTS:

$RSRP_s$ < -120 dBm
$threshServingLow_s$ (6 dB) + $qRxLevMin_s$ (-126 dBm)

$RSCP_n$ > -101 dBm
$threshXLow_{n,UTRAN}$ (14 dB) + $qRxLevMin_{n,UTRAN}$ (-115 dBm)

$RSRP_s$ < -124 dBm
$threshServingLow_s$ (2 dB) + $qRxLevMin_s$ (-126 dBm)

$RSCP_n$ > -101 dBm
$threshXLow_{n,UTRAN}$ (14 dB) + $qRxLevMin_{n,UTRAN}$ (-115 dBm)

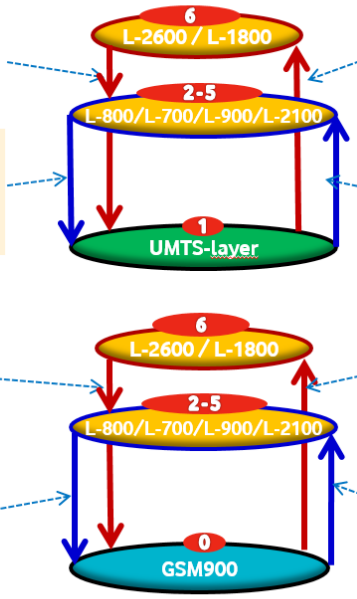
Re-selection from LTE to GSM:

$RSRP_s$ < -120 dBm
$threshServingLow_s$ (6 dB) + $qRxLevMin_s$ (-126 dBm)

$RxLev_n$ > -101 dBm
$threshXLow_n$ (14 dB) + $qRxLevMin_n$ (-115 dBm)

$RSRP_s$ < -124 dBm
$threshServingLow_s$ (2 dB) + $qRxLevMin_s$ (-126 dBm)

$RxLev_n$ > -101 dBm
$threshXLow_n$ (14 dB) + $qRxLevMin_n$ (-115 dBm)



Re-selection from UMTS to LTE:

$RSRP_n$ > -118 dBm
$threshHigh_{n,eUTRAN}$ (8 dB) + $qRxLevMin_{n,eUTRAN}$ (-126 dBm)

$RSRP_n$ > -118 dBm
$threshHigh_{n,eUTRAN}$ (8 dB) + $qRxLevMin_{n,eUTRAN}$ (-126 dBm)

Re-selection from GSM to LTE:

$RSRP_n$ > -118 dBm
$HPRIOTHR_n$ (8 dB) + QRXLEVMINE (-126 dBm)

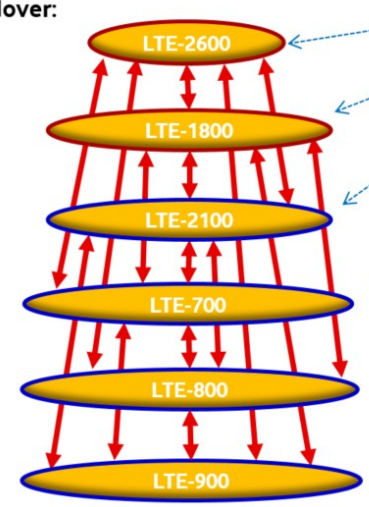
Re-selection from GSM to LTE:

$RSRP_n$ > -118 dBm
$HPRIOTHR_n$ (8 dB) + QRXLEVMINE (-126 dBm)

x ... idle mode priority

LTE Connected Mode Thresholds - Inter-frequency HO

Inter Frequency Handover:



Start Inter Frequency Measurements (no QCI-1)

$RSRP_s$ < -118 dBm (LTE-2600)
InterFreqHoA2ThdRsrp (-116 dBm) – InterFreqHoA1A2Hyst (2 dB)

$RSRP_s$ < -115 dBm (LTE-1800)
InterFreqHoA2ThdRsrp (-113 dBm) – InterFreqHoA1A2Hyst (2 dB)

$RSRP_s$ < -114 dBm or -115 dBm* (LTE-2100)
InterFreqHoA2ThdRsrp (-112 or -113* dBm) – InterFreqHoA1A2Hyst (2 dB)

$RSRP_s$ < -114 dBm (LTE-800/LTE-700/LTE-900)
InterFreqHoA2ThdRsrp (-112 dBm) – InterFreqHoA1A2Hyst (2 dB)

timeToTriggerA2 = **480** ms

IF Handover Execution

$RSRP_t$ > -112 dBm or -115 dBm* towards LTE-2600
InterFreqHoA4ThdRsrp (-114 or -117* dBm) + InterFreqHoA4Hyst (2 dB) + IfHoThdRsrpOffset (0 dB)

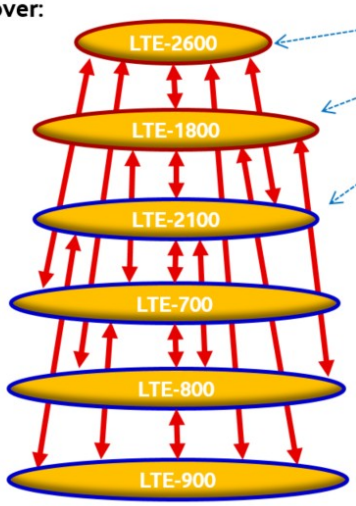
$RSRP_t$ > -112 dBm (towards all other layers)
InterFreqHoA4ThdRsrp (-114dBm or -117* dBm) + InterFreqHoA4Hyst (2 dB) + IfHoThdRsrpOffset (0 or 3* dB)

timeToTriggerA4 = **320** ms

*) special setting for dedicated cities: Berlin, Potsdam, Leipzig, Dresden, Chemnitz, Erfurt and Kiel

VoLTE Connected Mode Thresholds - Inter-frequency HO

Inter Frequency Handover:



Start Inter Frequency Measurements (QCI-1)

$RSRP_s$ < -116 dBm (LTE-2600)
InterFreqHoA2ThdRsrp (-114dBm) – InterFreqHoA1A2Hyst (2 dB)

$RSRP_s$ < -114 dBm (LTE-1800)
InterFreqHoA2ThdRsrp (-112 dBm) – InterFreqHoA1A2Hyst (2 dB)

$RSRP_s$ < -114 dBm (LTE-2100)
InterFreqHoA2ThdRsrp (-112 dBm) – InterFreqHoA1A2Hyst (2 dB)

$RSRP_s$ < -116 dBm (LTE-800/LTE-700/LTE-900)
InterFreqHoA2ThdRsrp (-114 dBm) – InterFreqHoA1A2Hyst (2 dB)

timeToTriggerA2 = **480** ms

IF Handover Execution

$RSRP_t$ > -112 dBm or -115 dBm* towards LTE-2600
InterFreqHoA4ThdRsrp (-114 or -117* dBm) + InterFreqHoA4Hyst (2 dB) + IfHoThdRsrpOffset (0 dB)

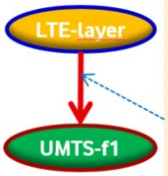
$RSRP_t$ > -112 dBm (towards all other layers)
InterFreqHoA4ThdRsrp (-114dBm or -117* dBm) + InterFreqHoA4Hyst (2 dB) + IfHoThdRsrpOffset (0 or 3* dB)

timeToTriggerA4 = **320** ms

*) special setting for dedicated cities: Berlin, Potsdam, Leipzig, Dresden, Chemnitz, Erfurt and Kiel

LTE Connected Mode Thresholds Inter-RAT ("priority" via time to trigger)

Inter RAT mobility:



Start IRAT Measurements

$RSRP_s$ < -124 dBm for LTE-800/-700/-900 & -2100
InterRatHoA2ThdRsrp (-122 dBm) – InterRatHoA1A2Hyst (2 dB)

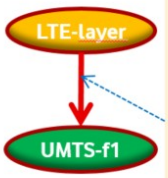
timeToTriggerA2 = 640ms

Coverage-Triggered WCDMA IRAT Handover

$RSCP_t$ > -102 dBm
InterRatHoUtranB1ThdRscp (-103 dBm) + hysteresisB1 (1 dB)

$Ec/N0_t$ > -11 dBm
InterRatHoUtranB1ThdEcn0 (-12 dB) + hysteresisB1 (1 dB)

timeToTriggerB1 = **320** ms



Start IRAT Measurements

$RSRP_s$ < -120 dBm for LTE-1800 and LTE-2600
InterRatHoA2ThdRsrp (-118 dBm) – InterRatHoA1A2Hyst (2 dB)

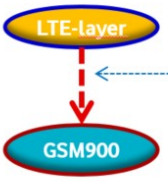
timeToTriggerA2 = 640ms

Coverage-Triggered WCDMA IRAT Handover

$RSCP_t$ > -102 dBm
InterRatHoUtranB1ThdRscp (-103 dBm) + hysteresisB1 (1 dB)

$Ec/N0_t$ > -11 dBm
InterRatHoUtranB1ThdEcn0 (-12 dB) + hysteresisB1 (1 dB)

timeToTriggerB1 = **320** ms



Start IRAT Measurements

$RSRP_s$ < -124 dBm for LTE-800/-700/-900 & -2100
InterRatHoA2ThdRsrp (-122 dBm) – InterRatHoA1A2Hyst (2 dB)
timeToTriggerA2 = 640ms

Release with Re-direct to GERAN

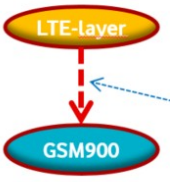
$RSCP_t$ > -99dBm for QCI-5 / $RSCP_t$ > -47dBm QCI-6..9
InterRatHoGeranB1Thd (-100 dBm/-48 dBm) + hysteresisB1 (1 dB)

timeToTriggerB1 = **640** ms

IRAT Blind

$RSRP_s$ < -126 dBm for all LTE cells / frequencies
BlindHoA1A2ThdRsrp (-126 dBm)
timeToTriggerA2 = 640ms (hard coded ?)

Release with Re-direct blind to GERAN



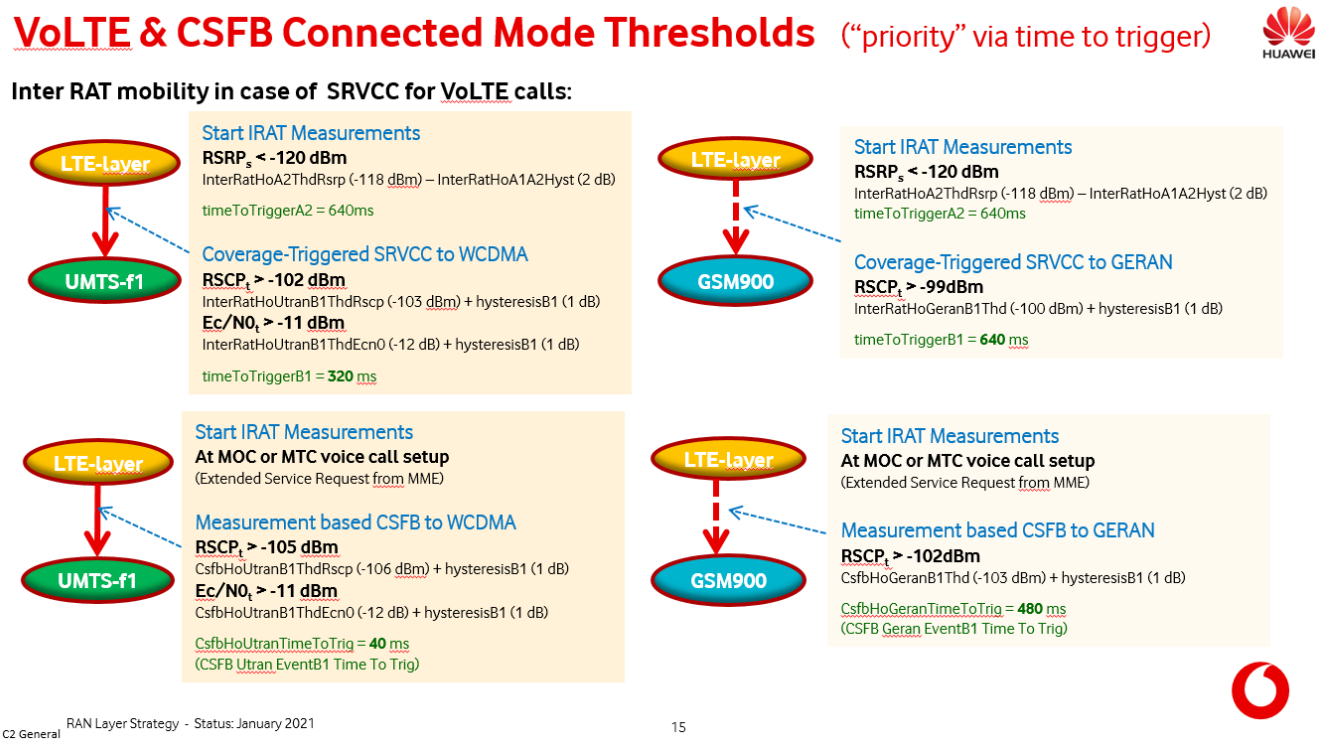
Start IRAT Measurements

$RSRP_s$ < -120 dBm for LTE-1800 and LTE-2600
InterRatHoA2ThdRsrp (-118 dBm) – InterRatHoA1A2Hyst (2 dB)
timeToTriggerA2 = 640ms

Release with Re-direct to GERAN

$RSCP_t$ > -99dBm for QCI-5 / $RSCP_t$ > -47dBm QCI-6..9
InterRatHoGeranB1Thd (-100 dBm/-48 dBm) + hysteresisB1 (1 dB)

timeToTriggerB1 = **640** ms



6. Attachments / Parameter lists

Colour coding for parameter configuration

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
MO	Parameter short name	Parameter full name		**Read only parameter**
MO	Parameter short name	Parameter full name		**CPCM** mapping to cell parameter

Huawei SRAN 4G Cell-level parameters configuration:

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
Cell	LocalCellId	Local Cell ID	LTE 800 cells: 0 for A sector cell 1 for B sector cell 2 for C sector cell LTE2600 cells: 4 for N / E sector cell 5 for O / F sector cell 6 for P/ G sector cell LTE1800 cells: 7 for H sector cell 8 for I sector cell 9 for K sector cell LTE2100 cells: 18 for T sector / 21 for W sector cell 19 for U sector / 22 for X sector cell 20 for V sector / 23 for Y sector cell	LTE 800 cells: 0 for A sector cell 1 for B sector cell 2 for C sector cell **LTE 700 cells:** **30 for A sector cell** **31 for B sector cell** **32 for C sector cell** **LTE 900 cells:** **24 for A sector cell** **25 for B sector cell** **26 for C sector cell** LTE2600 cells: 4 for N / E sector cell 5 for O / F sector cell 6 for P / G sector cell LTE1800 cells: 7 for H sector cell 8 for I sector cell 9 for K sector cell LTE2100 cells:

				18 for T sector / 21 for W sector cell 19 for U sector / 22 for X sector cell 20 for V sector / 23 for Y sector cell NB-IoT cells: 100 for A sector cell 101 for B sector cell 102 for C sector cell
Cell	CellId	Cell ID	LTE 800 cells: 1 for A sector cell 2 for B sector cell 3 for C sector cell LTE2600 cells: 5 for E sector / 13 for N sector cell 6 for F sector / 14 for O sector cell 7 for G sector / 15 for P sector cell LTE1800 cells: 8 for H sector cell 9 for I sector cell 10 for K sector cell LTE2100 cells: 19 for T sector / 22 for W sector cell 20 for U sector / 23 for X sector cell 21 for V sector / 24 for Y sector cell	LTE 800 cells: 1 for A sector cell 2 for B sector cell 3 for C sector cell **LTE 700 cells:** **31 for A sector cell** **32 for B sector cell** **33 for C sector cell** **LTE 900 cells:** **25 for A sector cell** **26 for B sector cell** **27 for C sector cell** LTE2600 cells: 5 for E sector / 13 for N sector cell 6 for F sector / 14 for O sector cell 7 for G sector / 15 for P sector cell LTE1800 cells: 8 for H sector cell 9 for I sector cell 10 for K sector cell LTE2100 cells: 19 for T sector / 22 for W sector cell 20 for U sector / 23 for X sector cell 21 for V sector / 24 for Y sector cell NB-IoT cells: 101 for A sector cell 102 for B sector cell 103 for C sector cell
Cell	FreqBand	Frequency band	20 for LTE 800 3 for LTE 1800 7 for LTE 2600 1 for LTE2100	20 for LTE 800 **28 for LTE 700** **8 for LTE 900** 3 for LTE 1800 7 for LTE 2600 1 for LTE 2100
Cell	UlEarfcn	Uplink EARFCN	24300 for LTE 800 19801 for LTE 1800 20850 for LTE 2600 18101 for LTE 2100 (10 MHz)	24300 for LTE 800 **27460 for LTE 700** **21600 for LTE 900** 19801 for LTE 1800 20850 for LTE 2600 ~~**18101 for LTE 2100 (10 MHz)**~~ ~~**18125 for LTE 2100 (10/15 MHz)**~~ **18100 for LTE 2100 (20 MHz)**
Cell	DlEarfcn	Downlink EARFCN	6300 for LTE 800 1801 for LTE 1800 2850 for LTE 2600 101 for LTE 2100 (10 MHz)	6300 for LTE 800 **9460 for LTE 700** **3600 for LTE 900** 1801 for LTE 1800 2850 for LTE 2600 ~~**101 for LTE 2100 (10 MHz)**~~ ~~**125 for LTE 2100 (10/15 MHz)**~~ **100 for LTE 2100 (20 MHz)**
Cell	UlBandWidth	Uplink bandwidth	CELL_BW_N50(10M) for LTE 800 CELL_BW_N100(20M) for LTE 1800 CELL_BW_N100(20M) for LTE 2600 CELL_BW_N50(10M) for LTE 2100	CELL_BW_N50(10M) for LTE 800 **CELL_BW_N50(10M) for LTE 700** **CELL_BW_N50(10M) for LTE 900** CELL_BW_N100(20M) for LTE 1800 CELL_BW_N100(20M) for LTE 2600 ~~**CELL_BW_N50(10M) for LTE 2100**~~ ~~**CELL_BW_N75(15M) for LTE 2100**~~ **CELL_BW_N100(20M) for LTE 2100**
Cell	DlBandWidth	Downlink bandwidth	CELL_BW_N50(10M) for LTE 800 CELL_BW_N100(20M) for LTE 1800 CELL_BW_N100(20M) for LTE 2600 CELL_BW_N50(10M) for LTE 2100	CELL_BW_N50(10M) for LTE 800 **CELL_BW_N50(10M) for LTE 700** **CELL_BW_N50(10M) for LTE 900** CELL_BW_N100(20M) for LTE 1800 CELL_BW_N100(20M) for LTE 2600 ~~**CELL_BW_N50(10M) for LTE 2100**~~ ~~**CELL_BW_N75(15M) for LTE 2100**~~ **CELL_BW_N100(20M) for LTE 2100**

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
PUSCHCfg	HoppingOffset	Hopping offset	22 for LTE800 (10 MHz), LTE1800 (20 MHz), LTE2600 (20 MHz), LTE2100 (10 MHz)	22 for LTE800 (10 MHz), **LTE700 (10 MHz),** LTE1800 (20 MHz), LTE2600 (20 MHz), LTE2100 (10 MHz) **0** **for LTE900 (5-10 MHz)**
CellSel	QRxLevMin	Minimum required RX level	-63 (-62 for high speed cells)	**-63** **(-62** cells with KLASSE=RURAL**)**

CellResel	QRxLevMin	Minimum required RX level	-63 (-62 for high speed cells)	**-63** **(-62** cells with KLASSE=RURAL**)**
CellResel	CellReselPriority	Cell reselection priority	**2 for LTE900 (5-10 MHz)** 3 for LTE800 (Macro) **4 for LTE700 (10 MHz)** **5 for LTE2100 (10/15 MHz)** 6 for LTE1800 (20 MHz) **6 for LTE2600**	2 for LTE900 (5-10 MHz) **(later to 1)** 3 for LTE800 (Macro) **2 for LTE700 (10 MHz)** **5 for LTE2100 (20 MHz)** **4 for LTE1800 (20 MHz)** **4 for LTE2600**
CellResel	ThrshServLow	Serving frequency lower priority threshold	1 (2dB) for L800, L700, L900, L2100 3 (6dB) for L1800 & L2600 ~~***4 (8dB) for all layers (High Mobility)***~~ 2 (4 dB) for 4x4 MIMO cells	**1 (2dB) for L800, L700, L900** **3 (6dB) for L1800 & L2600** **for all L2100 cells that have co-sited lower frequency LTE layer 3 (6dB) else 1 (2dB)** **2 (4 dB) for 4x4 MIMO cells**
CellResel	SNonIntraSearch	Threshold for non-intra frequency measurements	4 (8 dB) 6 (12 dB) for high speed cells 3 (6 dB) for 4x4 MIMO cells	**31 (62 dB) for LTE 1800 cells** **31 (62 dB) for LTE 2600 cells** **4 (8 dB)** **6 (12 dB) for high speed cells** **3 (6 dB) for 4x4 MIMO cells**

Intra-RAT parameters for all LTE cells:

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
EutranInterNFreq	DlEarfcn	Downlink EARFCN	6300 to LTE 800 frequency 101 to LTE 2100 10 MHz frequency 1801 to LTE 1800 frequency 2850 to LTE 2600 frequency	6300 to LTE 800 frequency **9460 to LTE 700 frequency if at the same site** **3600 to LTE 900 frequency if at the same site** ~~**101 to LTE 2100 10 MHz frequency**~~ ~~**125 to LTE 2100 10/15 MHz frequency**~~ **100 to LTE 2100 20 MHz frequency** 1801 to LTE 1800 frequency 2850 to LTE 2600 frequency
EutranInterNFreq	CellReselPriority	Inter frequency cell resel priority	2 towards LTE900 3 towards LTE800 (Macro) 4 towards LTE700 5 towards LTE2100 (10/15 MHz) 6 towards LTE1800 (20 MHz) 6 towards LTE2600	**2 towards LTE900 (later to 1)** 3 towards LTE800 (Macro) **2 towards LTE700** **5 towards LTE2100 (20 MHz)** **4 towards LTE1800 (20 MHz)** **4 towards LTE2600**
EutranInterNFreq	MeasBandWidth	Measurement bandwidth	MBW50 (10MHz) for LTE 800 MBW50 (10MHz) for LTE 2100 10MHz MBW100 (20MHz) for LTE 1800 MBW100 (20MHz) for LTE 2600	MBW50 (10MHz) for LTE 800 **MBW50 (10MHz) for LTE 700** **MBW25 (5MHz) for LTE 900** ~~**MBW50 (10MHz) for LTE 2100 10MHz**~~ ~~**MBW50 (10MHz) for LTE 2100 10/15MHz**~~ **MBW100 (20MHz) for LTE 2100 20MHz** MBW100 (20MHz) for LTE 1800 MBW100 (20MHz) for LTE 2600
EutranInterNFreq	ThreshXhigh	Inter frequency high priority threshold	6 LTE800 cell --> LTE 2600 freq. layer 6 LTE800 cell --> LTE 1800 freq. layer 5 LTE800 cell --> LTE 2100 freq. layer **5 LTE800 cell --> LTE 700 freq. layer** **0 LTE800 cell --> LTE 900 freq. layer** **6 LTE700 cell --> LTE 2600 freq. layer** **6 LTE700 cell --> LTE 1800 freq. layer** **5 LTE700 cell --> LTE 2100 freq. layer** **0 LTE700 cell --> LTE 800 freq. layer** **0 LTE700 cell --> LTE 900 freq. layer** **6 LTE900 cell --> LTE 2600 freq. layer** **6 LTE900 cell --> LTE 1800 freq. layer** **5 LTE900 cell --> LTE 2100 freq. layer** **5 LTE900 cell --> LTE 700 freq. layer** **5 LTE900 cell --> LTE 800 freq. layer** **0 LTE2600 cell --> LTE 1800 freq. layer** **0 LTE2600 cell --> LTE 2100 freq. layer** **0 LTE2600 cell --> LTE 700 freq. layer** **0 LTE2600 cell --> LTE 800 freq. layer** **0 LTE2600 cell --> LTE 900 freq.**	**5**

			layer **6 LTE1800 cell --> LTE 2600 freq. layer** **0 LTE1800 cell --> LTE 2100 freq. layer** **0 LTE1800 cell --> LTE 700 freq. layer** **0 LTE1800 cell --> LTE 800 freq. layer** **0 LTE1800 cell --> LTE 900 freq. layer** 6 LTE2100 cell --> LTE 2600 freq. layer 6 LTE2100 cell --> LTE 1800 freq. layer **0 LTE2100 cell --> LTE 700 freq. layer** **0 LTE2100 cell --> LTE 800 freq. layer** **0 LTE2100 cell --> LTE 900 freq. layer**	

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
EutranInterNFreq	ThreshXlow	Inter frequency lower priority threshold	6 LTE800 cell --> LTE 2600 freq. layer 6 LTE800 cell --> LTE 1800 freq. layer 5 LTE800 cell --> LTE 2100 freq. layer **5 LTE800 cell --> LTE 700 freq. layer** **5 LTE800 cell --> LTE 900 freq. layer** **6 LTE700 cell --> LTE 2600 freq. layer** **6 LTE700 cell --> LTE 1800 freq. layer** **5 LTE700 cell --> LTE 2100 freq. layer** **5 LTE700 cell --> LTE 800 freq. layer** **5 LTE700 cell --> LTE 900 freq. layer** **6 LTE900 cell --> LTE 2600 freq. layer** **6 LTE900 cell --> LTE 1800 freq. layer** **5 LTE900 cell --> LTE 2100 freq. layer** **5 LTE900 cell --> LTE 700 freq. layer** **5 LTE900 cell --> LTE 800 freq. layer** 6 LTE2600 cell --> LTE 1800 freq. layer 5 LTE2600 cell --> LTE 2100 freq. layer **5 LTE2600 cell --> LTE 700 freq. layer** 5 LTE2600 cell --> LTE 800 freq. layer **5 LTE2600 cell --> LTE 900 freq. layer** 6 LTE1800 cell --> LTE 2600 freq. layer 5 LTE1800 cell --> LTE 2100 freq. layer **5 LTE1800 cell --> LTE 700 freq. layer** 5 LTE1800 cell --> LTE 800 freq. layer **5 LTE1800 cell --> LTE 900 freq. layer** 6 LTE2100 cell --> LTE 2600 freq. layer 6 LTE2100 cell --> LTE 1800 freq. layer **5 LTE2100 cell --> LTE 700 freq. layer** 5 LTE2100 cell --> LTE 800 freq. layer **5 LTE2100 cell --> LTE 900 freq. layer**	**5**
EutranInterNFreq	QRxLevMin	Minimum required RX level	-63 (-62 for high speed cells)	**-63** **(-62** cells with KLASSE=RURAL**)**
EutranInterNFreq	MlbFreqPriority	MLB Frequency Priority	5 towards LTE-800 5 towards LTE-2100 (10MHz) 6 towards LTE-1800 (20MHz) 7 towards LTE-2600	**3 towards LTE-900** **3 towards LTE-800** **3 towards LTE-700** **6 towards LTE-2100 (20MHz)** **5 towards LTE-1800 (20MHz)** 7 towards LTE-2600
EutranInterNFre	MeasFreqPriority	Measurement	11 towards LTE-900	**11 towards LTE-900**

q		Frequency Priority	12 towards LTE-800 13 towards LTE-700 14 towards LTE-2100 (10/15MHz) 16 towards LTE-1800 (20MHz) 15 towards LTE-2600	**12 towards LTE-800** **10 towards LTE-700** **16 towards LTE-2100** **(20MHz)** **14 towards LTE-1800** **(20MHz)** 15 towards LTE-2600
EutranInterNFreq	IfHoThdRsrpOffset	Cov-based Inter-Freq HO Thd RSRP Offset	0	**Source freq->Target freq:** **L800->L2600: 0** **L700->L2600: 0** **L900->L2600: 0** **L1800->L2600: 0** **L2100->L2600: 0** **L800->L1800: 0 or 3*** **L700->L1800: 0 or 3*** **L900->L1800: 0 or 3*** **L2100->L1800: 0 or 3*** **L2600->L1800: 0 or 3*** **L800->L2100: 0 or 3*** **L700->L2100: 0 or 3*** **L900->L2100: 0 or 3*** **L1800->L2100: 0 or 3*** **L2600->L2100: 0 or 3*** **L700->L800: 0 or 3*** **L900->L800: 0 or 3*** **L1800->L800: 0 or 3*** **L2100->L800: 0 or 3*** **L2600->L800: 0 or 3*** **L800->L700: 0 or 3*** **L900->L700: 0 or 3*** **L1800->L700: 0 or 3*** **L2100->L700: 0 or 3*** **L2600->L700: 0 or 3*** **L800->L900: 0 or 3*** **L700->L900: 0 or 3*** **L1800->L900: 0 or 3*** **L2100->L900: 0 or 3*** **L2600->L900: 0 or 3***

* special IfHoThdRsrpOffset setting for dedicated cities: Berlin, Potsdam, Leipzig, Dresden, Chemnitz, Erfurt and Kiel

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
RatFreqPriorityGroup	Priority	Priority	0 for GSM900 1 for UMTS f1(dlarfcn=10564) 3 for LTE800 (Macro) 5 for LTE2100 (10 MHz) 6 for LTE1800 (20 MHz) 7 for LTE2600	0 for GSM900 ~~**1 for UMTS f1(dlarfcn=10564)**~~ **1 for LTE900** **2 for LTE700** **3 for LTE800 (Macro)** **4 for LTE1800 (20 MHz)** **4 for LTE2600** **5 for LTE2100 (20 MHz)**
EutranIntraFreqNCell	DlEarfcn	Downlink EARFCN	2850 for relation to LTE 2600 1801 for relation to LTE 1800 6300 for relation to LTE 800 101 for relation to LTE 2100(10MHz)	2850 for relation to LTE 2600 1801 for relation to LTE 1800 6300 for relation to LTE 800 **9460 for relation to LTE 700** **3600 for relation to LTE 900** ~~**101 for relation to LTE 2100 (10MHz)**~~ ~~**125 for relation to LTE 2100 (10/15MHz)**~~ **100 for relation to LTE 2100 (20MHz)**
EutranInterFreqNCell	DlEarfcn	Downlink EARFCN	2850 for relation to LTE 2600 1801 for relation to LTE 1800 6300 for relation to LTE 800 101 for relation to LTE 2100 (10MHz)	2850 for relation to LTE 2600 1801 for relation to LTE 1800 6300 for relation to LTE 800 **9460 for relation to LTE 700** **3600 for relation to LTE 900** ~~**101 for relation to LTE 2100 (10MHz)**~~ ~~**125 for relation to LTE 2100 (10/15MHz)**~~ **100 for relation to LTE 2100 (20MHz)**
EutranExternalCell	CellId	Cell ID	See MO Cell parameter CellId	See MO Cell parameter CellId
EutranExternalCell	DlEarfcn	Downlink EARFCN	6300 for LTE 800 1801 for LTE 1800 2850 for LTE 2600 101 for LTE 2100 (10MHz)	6300 for LTE 800 **9460 for LTE 700** **3600 for LTE 900** 1801 for LTE 1800 2850 for LTE 2600 ~~**101 for LTE 2100 (10MHz)**~~ ~~**125 for LTE 2100 (10/15MHz)**~~

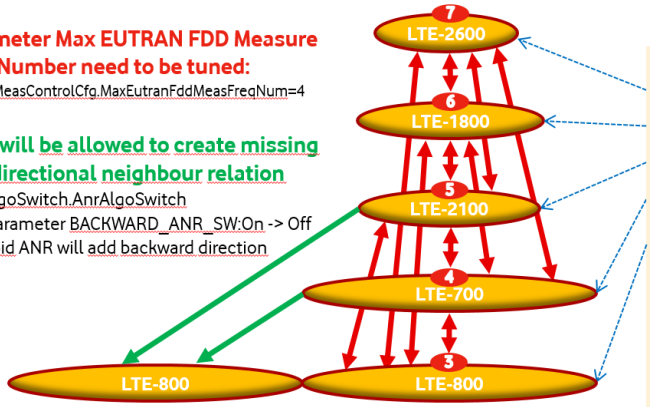
				100 for LTE 2100 (20MHz)
UtranNFreq	CellReselPriority	Cell reselection priority	3	**1**
UtranNFreq	ThreshXLow	UTRAN lower priority threshold	3 (6 dB) 6 (12 dB) for high speed cells	**7 (14 dB)** 6 (12 dB) for high speed cells
GeranNfreqGroup	CellReselPriority	Cell reselection priority	1	**0**
CellAlgoSwitch	AnrAlgoSwitch	ANR Algorithm Switch	**1** (decimal based on SRAN13.1 bit map) binary: 0001 BACKWARD_ANR_SW:On, INTRA_RAT_OVERDISTANCE_SW:Off, UTRAN_OVERDISTANCE_SW:Off, LTE_AUTON_GAP_CGI_SW:Off	**0** (decimal based on SRAN13.1 bit map) binary: 0000 **BACKWARD_ANR_SW:Off,** INTRA_RAT_OVERDISTANCE_SW:Off, UTRAN_OVERDISTANCE_SW:Off, LTE_AUTON_GAP_CGI_SW:Off

LTE Connected Mode Thresholds

Inter Frequency Handover:

Parameter Max EUTRAN FDD Measure Freq Number need to be tuned:
CellUeMeasControlCfg.MaxEutranFddMeasFreqNum=4

ANR will be allowed to create missing uni-directional neighbour relation
CellAlgoSwitch.AnrAlgoSwitch
sub-parameter BACKWARD_ANR_SW:On -> Off
To avoid ANR will add backward direction



Start Inter Frequency Measurements (no QCI-1)
$RSRP_s$ < -118 dBm (LTE-2600)
InterFreqHoA2ThdRsrp (-116 dBm) – InterFreqHoA1A2Hyst (2 dB)
$RSRP_s$ < -115 dBm (LTE-1800)
InterFreqHoA2ThdRsrp (-113 dBm) – InterFreqHoA1A2Hyst (2 dB)
$RSRP_s$ < -114 dBm (LTE-2100)
InterFreqHoA2ThdRsrp (-112 dBm) – InterFreqHoA1A2Hyst (2 dB)
$RSRP_s$ < -114 dBm (LTE-700)
InterFreqHoA2ThdRsrp (-112 dBm) – InterFreqHoA1A2Hyst (2 dB)
$RSRP_s$ < -114 dBm (LTE-800)
InterFreqHoA2ThdRsrp (-112 dBm) – InterFreqHoA1A2Hyst (2 dB)
timeToTriggerA2 = **480** ms

IF Handover Execution
$RSRP_t$ > -112 dBm
InterFreqHoA4ThdRsrp (-114dBm) + InterFreqHoA4Hyst (2 dB)
timeToTriggerA4 = **480** ms

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Cell-level parameters mobility configuration:

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
CellHoParaCfg	BlindHoA1A2ThdRsrp	BlindHO A1A2 RSRP trigger threshold	-124 dBm	**-130 dBm**
CellUeMeasControlCfg	MaxEutranFddMeasFreqNum	Max EUTRAN FDD Measure Freq Number	4	8
InterRatHoCommGroup	InterRatHoA1ThdRsrp	InterRAT A1 RSRP trigger threshold	-114 dBm	-114 dBm -116 dBm for 4x4 MIMO for high speed cells: -114 dBm for QCI2 to QCI9 -112 dBm for QCI1 for all cells with KLASSE=RURAL: -112 dBm for all high speed cells with KLASSE=RURAL: -112 dBm for QCI2 to QCI9 (InterRatHoCommGroupId= 0) -110 dBm for QCI1 (InterRatHoCommGroupId= 1)
InterRatHoCommGroup	InterRatHoA2ThdRsrp	InterRAT A2 RSRP trigger threshold	QCI2 to QCI9 **-122 dBm for L800, L700, L900 & L2100** -118 dBm for L1800 & L2600 -120 dBm for 4x4MIMO L1800 & L2600 -116 dBm for QCI1 -118 dBm for QCI1 on 4x4MIMO L1800 & L2600 for high speed cells: -118 dBm for QCI2 to QCI9 -111 dBm for QCI1 for all cells with KLASSE=RURAL: InterRatHoCommGroupId=0 (for QCI2 to QCI9) **-120 dBm for LTE800, LTE700, L900 & LTE2100** -116 dBm for LTE1800 & LTE2600 InterRatHoCommGroupId=1	QCI2 to QCI9 InterRatHoCommGroupId=0 **-126 dBm for L800, L700, L900,L2100,** L1800 & L2600 InterRatHoCommGroupId=1 **-118 dBm for QCI1** for high speed cells: InterRatHoCommGroupId=1 **-116 dBm for QCI1** for all cells with KLASSE=RURAL: InterRatHoCommGroupId=1 **-116 dBm for QCI1** for all high speed cells with KLASSE=RURAL: **-114 dBm for QCI1** (InterRatHoCommGroupId= 1)

			-114 dBm for QCI1 for all high speed cells with KLASSE=RURAL: -116 dBm for QCI2 to QCI9 (InterRatHoCommGroupId= 0) -109 dBm for QCI1 (InterRatHoCommGroupId= 1)	
InterRatHoCommGroup	GeranB2Thd1Rsrp	GERAN B2 RSRP Threshold 1	**-116 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-114 dBm** for QCI1 (InterRatHoCommGroupId= 1) for all cells with KLASSE=RURAL: **-114 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-112 dBm** for QCI1 (InterRatHoCommGroupId= 1)	**-116 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-119 dBm** for QCI1 (InterRatHoCommGroupId= 1) for all cells with KLASSE=RURAL: **-114 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-117 dBm** for QCI1 (InterRatHoCommGroupId= 1)
InterRatHoCommGroup	UtranB2Thd1Rsrp	UTRAN B2 RSRP Threshold 1	**-116 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-114 dBm** for QCI1 (InterRatHoCommGroupId= 1) for all cells with KLASSE=RURAL: **-114 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-112 dBm** for QCI1 (InterRatHoCommGroupId= 1)	**-116 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-116 dBm** for QCI1 (InterRatHoCommGroupId= 1) for all cells with KLASSE=RURAL: **-114 dBm** for QCI2 to QCI9 (InterRatHoCommGroupId= 0) **-114 dBm** for QCI1 (InterRatHoCommGroupId= 1)
InterRatHoGeranGroup	InterRatHoGeranB1TimeToTrig	GERAN B1 time to trigger	**480**	**320ms for high speed cells**

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
InterFreqHoGroup	InterFreqHoA1ThdRsrp	A4A5 Based Interfreq A1 RSRP Threshold	QCI2 to QCI9 L800: -112 L1800: -112 or **-113*** L2100: -112 or **-113*** L2600: -112 or **-116*** QCI1: -112 for all frequencies	QCI2 to QCI9 L800, **L700&L900: -112** L1800: -112 or -113* L2100: -112 or -113* L2600: -112 or -116* QCI1: -112 for all frequencies -114 dBm for 4x4 MIMO for high speed cells: -112 dBm for QCI2 to QCI9 All other layers (except LTE2100) -109 dBm for QCI1 LTE2100 -106 dBm for QCI1 for all cell with KLASSE=RURAL: -110 for high speed cells with KLASSE=RURAL: -110 dBm for QCI2 to QCI9 (InterFreqHoGroupId= 0) All other layers (except LTE2100) -107 dBm for QCI1 LTE2100: -104 dBm for QCI1 (InterFreqHoGroupId= 1)
InterFreqHoGroup	InterFreqHoA2ThdRsrp	A4A5 Based Interfreq A2 RSRP Threshold	QCI2 to QCI9 -112 dBm for LTE800 **-112 dBm for LTE700** -113 dBm for LTE1800 -116 dBm for LTE2600	QCI2 to QCI9 **-112 dBm for LTE800, LTE700 & LTE900** -113 dBm for LTE1800 **-112 or -113* dBm for LTE2100** -116 dBm for LTE2600 -115 dBm for LTE1800 4x4 MIMO -118 dBm for LTE2600 4x4 MIMO

			-112 or -113* dBm for LTE2100 QCI1 -114 dBm for LTE800 **-114 dBm for LTE700** -112 dBm for LTE1800 -114 dBm for LTE2600 -112 dBm for LTE2100	QCI1 **-114 dBm for** LTE800, **LTE700, LTE900** & LTE2600 -112 dBm for LTE1800 & LTE2100 -114 dBm for LTE1800 for 4x4 MIMO -116 dBm for LTE2600 for 4x4 MIMO for high speed cells: QCI2 to QCI9 **-112 dBm for** LTE800, **LTE700, LTE900** & LTE2100 -113 dBm for LTE1800 -116 dBm for LTE2600 All other layers (exceptLTE2100): -111 dBm for QCI1 LTE2100 -107 dBm for QCI1 for all cells with KLASSE=RURAL: InterFreqHoGroupId=0 (QCI2 to QCI9) **-110 dBm for** LTE800, **LTE700, LTE900** & LTE2100 -111 dBm for LTE1800 -114 dBm for LTE2600 InterFreqHoGroupId=1 (QCI1) **-112 dBm for** LTE800, **LTE700, LTE900** & LTE2600 -110 dBm for LTE1800 & LTE2100 for high speed with KLASSE=RURAL: QCI2 to QCI9 (InterFreqHoGroupId=0) **-110 dBm for** LTE800, **LTE700, LTE900** & LTE2100 -111 dBm for LTE1800 -114 dBm for LTE2600 All other layers (exceptLTE2100) -109 dBm for QCI1 LTE2100 -106 dBm for QCI1 (InterFreqHoGroupId=1)
InterFreqHoGroup	InterFreqHoA4ThdRsrp	CoverageBased Interfreq RSRP threshold	-114 or **-117*** dBm for all QCIs	-114 or **-117*** dBm for all QCIs High Speed LTE2100 -114 QCI1 for all cells with KLASSE=RURAL: -112 High Speed LTE2100 -113 QCI1
InterFreqHoGroup	InterFreqLoadBased HoA4ThdRsrp	Load Based Interfreq RSRP threshold	-112 dBm for all QCIs	-112 dBm for all QCIs

*) special setting for dedicated cities: Berlin, Potsdam, Leipzig, Dresden, Chemnitz, Erfurt and Kiel

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
CellMLB	InterFreqMlbThd	Inter-Frequency Mobility Load Balancing Threshold	45 on LTE800 cell 45 on LTE2100 cell 60 on LTE1800 cell 60 on LTE2600 cell	**30 on LTE800 cell** **30 on LTE700 cell** **30 on LTE900 cell** **30 on LTE2100 cell** **30 on LTE1800 cell** **30 on LTE2600 cell**
CellMLB	InterFreqMlbUeNumThd	Inter-frequency Mobility Load Balancing UE Number Threshold	100 for LTE800 100 for LTE2100 cell 150 for LTE1800 150 for LTE2600	**30 for LTE800** **30 for LTE700** **30 for LTE900** **50 for LTE2100** **30 for LTE1800** **50 for LTE2600**

CellMlbHo	MlbMatchOtherFeatureMode	MLB Match Other Feature Mode	**HoAdmitSwitch:On**, X2RoHoAdmitSwitch:Off, NCellSelectSwitch:Off, IfBackoffHoInRejectSwitch: Off	**HoAdmitSwitch:Off**, X2RoHoAdmitSwitch:Off, NCellSelectSwitch:Off, IfBackoffHoInRejectSwitch: Off
CellAlgoSwitch	MultiFreqPriControlSwitch	Multi Frequency Priority Control Switch	FixedMeasObjIDSwitch:Off, VoipMeasFreqPriSwitch:Off, PsMeasFreqPriSwitch:Off	**FixedMeasObjIDSwitch: On,** VoipMeasFreqPriSwitch:Off, PsMeasFreqPriSwitch:Off
CellAlgoSwitch	CovBasedInterFreqHoMode	Coverage Based Inter Frequency Handover Mode	BASEDONFREQPRIORITY (BASEDONFREQPRIORITY)	**HANDOVERIMMEDIATELY (HANDOVERIMMEDIATELY)**
CellPdcchAlgo	CfiAdjCceThld	CFI Adjustment CCE Threshold	8CCE for L800, L700, L900, L2100 16CCE for L1800, L2600	8CCE for L800, L700, L900 ~~**12CCE for L2100 (15MHz)**~~ **16CCE** for L1800, **L2100(20MHz)** & L2600
CellPdcchAlgo	PdcchAdjAlgoSwitch	PDCCH Adjust Algorithm Switch	CCE8PcOptSwitch:Off, AggLvl8PwrIncreaseUpperLimitSw:Off EnhCfiAdptOptSwitch:Off, PdcchRobustnessEnhSw:Off	8 **1000** CCE8PcOptSwitch:Off, AggLvl8PwrIncreaseUpperLimitSw:Off, EnhCfiAdptOptSwitch:Off, PdcchRobustnessEnhSw:On (LTE2100 – 15/20MHz)

Parameters only for LTE-2100 cell blind CSFB mobility configuration :

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
ENodeBAlgoSwitch	HoModeSwitch	Handover Mode switch → temporarily decided to switch off due to high failure ratio	Bit0 (not used) UtranVoipCapSwitch:Off, Bit2 (not used) Cdma1xRttVoipCapSwitch:Off, UtranPsHoSwitch:On, GeranPsHoSwitch:Off, CdmaHrpdNonOptimisedHoSwitch:Off, CdmaHrpdOptimisedHoSwitch:Off, GeranNaccSwitch:Off, GeranCcoSwitch:Off, UtranSrvccSwitch:On, GeranSrvccSwitch:On, Cdma1xRttSrvccSwitch:Off, UtranRedirectSwitch:On, GeranRedirectSwitch:On, CdmaHrpdRedirectSwitch:Off, Cdma1xRttRedirectSwitch:Off, BlindHoSwitch:Off, LcsSrvccSwitch:Off, AutoGapSwitch:On, UeVoipOnHspaCapSwitch:Off, UtranFddB1CapSwitch:Off, CdmaHrpdNonOptMeaHoSwitch:Off	Bit0 (not used) UtranVoipCapSwitch:Off, Bit2 (not used) Cdma1xRttVoipCapSwitch:Off, UtranPsHoSwitch:On, GeranPsHoSwitch:Off, CdmaHrpdNonOptimisedHoSwitch:Off, CdmaHrpdOptimisedHoSwitch:Off, GeranNaccSwitch:Off, GeranCcoSwitch:Off, UtranSrvccSwitch:On, GeranSrvccSwitch:On, Cdma1xRttSrvccSwitch:Off, UtranRedirectSwitch:On, GeranRedirectSwitch:On, CdmaHrpdRedirectSwitch:Off, Cdma1xRttRedirectSwitch:Off, **BlindHoSwitch:Off,** LcsSrvccSwitch:Off, AutoGapSwitch:On, UeVoipOnHspaCapSwitch:Off, UtranFddB1CapSwitch:Off, CdmaHrpdNonOptMeaHoSwitch:Off
CellHoParaCfg	HoModeSwitch	Handover Mode switch → temporarily decided to switch off due to high failure ratio	BlindHoSwitch:Off, UtranPsHoSwitch:On, UtranSrvccSwitch:On, GeranSrvccSwitch:On, UtranRedirectSwitch:On, GeranRedirectSwitch:On, UFCsfbBlindHoDisSwitch:Off, HighSpeedCsfbBlindSwitch:Off	**BlindHoSwitch:Off,** UtranPsHoSwitch:On, UtranSrvccSwitch:On, GeranSrvccSwitch:On, UtranRedirectSwitch:On, GeranRedirectSwitch:On, UFCsfbBlindHoDisSwitch:Off, HighSpeedCsfbBlindSwitch:Off
UtranNCell	BlindHoPriority	Blind handover priority	0 for all UTRAN neighbour cells	0 for all UTRAN neighbour cells **31** **for co-sector UTRAN neighbour cell of LTE2100 cell**

-3G parameters will be deleted in the next NOWO update -

Huawei SRAN 3G

Cell-level parameters for all (buffer zone & Co-Site zone of the refarmed sites) UMTS cells

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
UCELLNFREQPRIOINFO	EARFCN	E-UTRA Absolute	6300 for LTE800	6300 for LTE800

		Radio Frequency Channel Number	1836 for LTE1800 20MHz 2850 for LTE2600 101 for LTE2100 10MHz 125 for LTE2100	**1801 for LTE1800 20MHz** 2850 for LTE2600 **101 for LTE2100 10MHz** **125 for LTE2100 10/15MHz** 3600 for LTE900 only for UMTS cells without other co-sited LTE layer
UCELLNFREQPRIOINFO	EMeasBW	Measurement Bandwidth	D50 for LTE800 D100 for LTE1800 20MHz D100 for LTE2600 D25* for LTE2100 10MHz D25 for LTE2100 5MHz	D50 for LTE800 D100 for LTE1800 20MHz D100 for LTE2600 **D50 for LTE2100 10MHz** **D50* for LTE2100 15MHz** D25 for LTE900
UCELLNFREQPRIOINFO	EQrxlevmin	Minimum Required RSRP Threshold of the E-UTRA Cell	-63 (-126dBm)	**-63 (-126dBm)** 3G(co-sited) KLASSE=RURAL: **-62 (-124dBm)**
UCELLNFREQPRIOINFO	NPriority	Absolute Priority Level of the E-UTRA Frequency	**2 for LTE2100 5 MHz or 4 for LTE2100 10 MHz** 5 for LTE 2600 6 for LTE1800 20MHz 7 for LTE800	2 for LTE900 **4 for LTE2100 10/15 MHz** 5 for LTE 2600 6 for LTE1800 20MHz 7 for LTE800
UCELLNFREQPRIOINFO	ThdToHigh	RSRP Threshold for High-prio-freq Reselection	**5 (10dB)**	**4 (8dB)**

* D50 for LTE2100 15MHz instead of D75 in a first step (usage of limited power for specific sites under evaluation)

Cell-level parameters for all (buffer zone & Co-Site zone of the refarmed sites) UMTS cells

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
UCELLSELRESEL	SPriority	Absolute priority level of the serving cell	3	**1**
UCELLHSUPA	ErgchEhich CodeNum	Code Number for E-RGCH/E-HICH	3	**6 for UMTS2100**
UCELLCAC	MaxHsdpa UserNum	Maximum HSDPA user number	Rule is for F1 Cells: 64 Rule is for F2 Cells: 64 Rule is for F3 Cells: 128	UMTS Refarming(10Mhz) Rule is for F1 Cells: 128 UMTS2100(5Mhz) Rule is for F1 Cells: 128 Rule is for F2 Cells: 128
UCELLINTERRATHOCOV	InterRATCS Thd2DEcN0	Inter-RAT CS Measure Start Ec/No THD	-19 (city) -13(rural)	**-13**
UCELLINTERRATHOCOV	InterRATCS Thd2FEcN0	Inter-RAT CS Measure Stop Ec/No THD	-19 (city) -13(rural)	**-13**

Parameter settings for all UMTS cells with IRAT neighbour relation to LTE-cell:

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
ULTECELL	LTEArfcn	LTE Cell Downlink Frequency	6300 for LTE800 2850 for LTE2600 1836 for LTE1800 20MHz **101 for LTE2100 10MHz**	6300 for LTE800 2850 for LTE2600 **1801 for LTE1800 20MHz** **101 for LTE2100 10MHz**

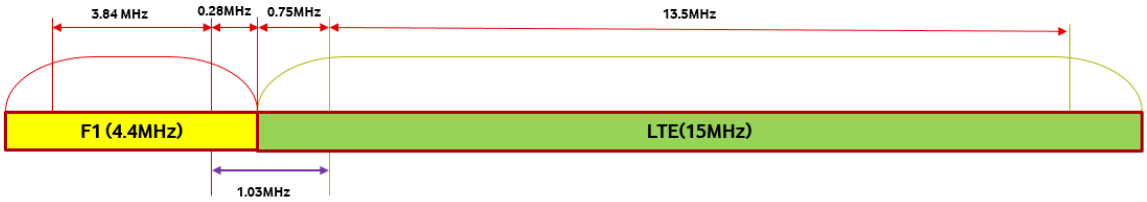
			125 for LTE2100 5MHz	**125 for LTE2100** **10/15MHz** 3600 for LTE900
ULTECELL	LTEBand	LTE Cell Frequency Band	20: BAND20 for LTE800 7: BAND7 for LTE2600 3: BAND3 for LTE1800 1: BAND1 for LTE2100	20: BAND20 for LTE800 7: BAND7 for LTE2600 3: BAND3 for LTE1800 1: BAND1 for LTE2100 8: BAND8 for LTE900

Equipment parameters

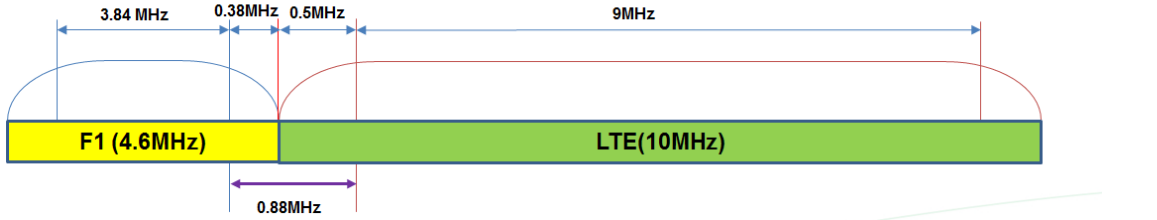
Managed Object	Parameter ID	Parameter Name	Old Setting	New Setting
FREQBWH	FMBWH	Frequency Min Bandwidth	5000	**4400**

MML CMD example:
SET FREQBWH:CN=0,SRN=100,SN=0,FMBWH=4400;{MXUxxx}
SET FREQBWH:CN=0,SRN=101,SN=0,FMBWH=4400;{MXUxxx}
SET FREQBWH:CN=0,SRN=102,SN=0,FMBWH=4400;{MXUxxx}

- **15MHz Refarming (Total Guard band of 1.03 MHz)**



10MHz Refarming (Total Guard band of 0.88 MHz)



Re-farming of 10Mhz (UMTS 5Mhz - F1): Resource share allocation (CE) to F1:

- allocate 3 intra_frequency cells into the same board
- UL/DL groups needs to be assigned to Group0

1) Delete DC configuration as follows:
//check DC group and localcellid, if exist, **please delete them**
- LST NODEBMULTICELLGRPITEM

- RMV NODEBMULTICELLGRPITEM

2) //check **all DC group id and delete them**

- LST NODEBMULTICELLGRP
- RMV NODEBMULTICELLGRP: MULTICELLGRPID=xxxx;

3) //reallocate local cell resource **(notice: cell RST, traffic will be interrupt, please operate in non-busy time)**

- STR REALLOCLOCELL

Only UL needs to be configured:

RMV NODEBMULTICELLGRPITEM:MULTICELLGRPID=0, ULOCELLID=0;
RMV NODEBMULTICELLGRP:MULTICELLGRPID=0;
RMV ULOCELL:ULOCELLID=<cell-sector0-F3>;
RMV ULOCELL:ULOCELLID=<cell-sector0-F2>;
MOD ULOCELL:ULOCELLID=<cell-sector0-F1>,LOCELLTYPE=NORMAL_CELL,ULBASEBANDEQMID=0;
LST BASEBANDEQM:BASEBANDEQMID=1,BASEBANDEQMTYPE=UL;
RMV BASEBANDEQM:BASEBANDEQMID=1,BASEBANDEQMTYPE=UL;
LST BASEBANDEQM:BASEBANDEQMID=0,BASEBANDEQMTYPE=UL;
DSP BRD; (check how many boards are available)
“”””””””””””””(add all WBBP boards to Group0) “”””””””””””””””””””””””””””
MOD BASEBANDEQM:BASEBANDEQMID=0,BASEBANDEQMTYPE=UL,OPMODE=ADD,SN=0;
STR REALLOCLOCELL

Neighbour relations shall be introduced during LTE 2100 re-farming rollout by vendor scripting service based on input from regional radio planning or CPCM.
Input for neighbour relation need to consider predicted coverage overlapping areas and below mentioned approach:

LTE2100 5MHz Refarming - outdated

DC-HSDPA NodeB – Dual Carrier reconfiguration to support F1&F2 instead of F2&F3:

Object	CDD Name	Parameter Name	Old Setting	New Setting	Comment
NODEBMULTICELLGRP	MULTICELLGRPID	Multiple Carrier Cell Group ID	–	MULTICELLGRPID=<MULTICELLGRPID1>	Flexible dual carrier activation configuration, 1. Create new Multiple Carrier Cell Group ID, 2. Configure the new Multiple Carrier Cell Group ID to F1, F2, and F3 in the sector. 3. Current case F2F3 are on one group, Then we need to add F3 to the group,
	MULTICELLGRPID	MULTICELLGRPTYPE	–	HSDPA	
NODEBMULTICELLGRPITEM	MULTICELLGRPID	Multiple Carrier Cell Group ID	–	MULTICELLGRPID=<MULTICELLGRPID1>,	
	ULOCELLID	Local Cell ID	–	ULOCELLID=<CELL_F1>	
	ULOCELLID	Local Cell ID	–	ULOCELLID=<CELL_F2>	
	ULOCELLID	Local Cell ID	–	ULOCELLID=<CELL_F3>	
UCELLSETUP	TCell	Time Offset	F1 and F2 different TCELL	F1 and F2 same TCELL	TCELL should be the same on F1F2F3 on the same sector
UCELLALGOSWITCH	DC-HSDPA	Cell DC-HSDPA function switch	3 carriers: OFF for F1;ON for F2/F3 2 carriers: ON for F1 and F2	ON for F1 and F2	Turn on DC on F1

On refarmed sites the F1 and F2 shall use the same Tcell in order to enable the DC-HSDPA, as an example:

Carrier	CELLNAME	TCELL
1	"BXUA01A"	CHIP0
2	"BXUA01B"	CHIP256
3	"BXUA01C"	CHIP512
5	"BXUA01E"	CHIP0
6	"BXUA01F"	CHIP256
7	"BXUA01G"	CHIP512

IMPORTANT NOTE:

LTE2100 10MHz Refarming
DC-HSDPA need to be deleted

- DC-HSDPA activation on F1:
  MOD UCELLALGOSWITCH: CellId35333, HspaPlusSwitch=DC_HSDPA-1;

UMTS to LTE PS Redirection. Managed Object URATFREQPRIOGROUP

SPID	RatFreqPriorityGroupId	RatType	DLARFCN	DediPriority
256	1	LTE	2850 (LTE2600)	5
		LTE	6300 (LTE800)	7
		LTE	1801(LTE1800)	6
		LTE	101 (LTE 2100 10 MHz)	**4**
		LTE	125 (LTE 2100 15 MHz)	**4**
		UMTS	10564	3
		UMTS	10588	3
		UMTS	10612	3
255	2	UMTS	10564	3
		UMTS	10588	3
		UMTS	10612	3

Blind PS Redirection Preferred During a Service-Based UMTS-to-LTE PS Redirection
HO_LTE_SERVICE_BLIND_FIRST_SWITCH – 1 (only for the collocated 3G cells in the re-farmed site)

U2L Blind PS Redirection

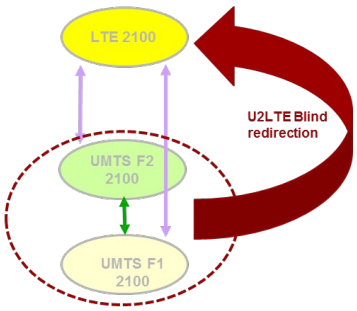
Proposal (1/2)

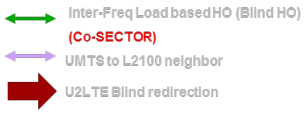
- In only Scenarios of UMTS and LTE 2100 Co-located site, We propose blind U2LTE redirection and blind fast return

1. Blind PS Redirection Preferred During a Service-Based UMTS-to-LTE PS Redirection

During a service-based UMTS-to-LTE PS redirection procedure, if a UE does not support LTE measurement, it can perform a blind redirection. If the UE supports LTE measurement, it must perform LTE measurement and the RNC will determine whether UE can perform a redirection or handover according to the measurement result. In the continuous LTE coverage scenario or UMTS and LTE co-coverage scenario, LTE signals are strong enough and the success rate of blind UMTS-to-LTE redirections is high. In this case, blind UMTS-to-LTE redirections can reduce the impacts of measurement in compressed mode.

When ***U2LBlindRedirSwitch(BSC6900,BSC6910)*** is set to **ON** and **HO_LTE_SERVICE_BLIND_FIRST_SWITCH** under the ***U2LServAlgoSwitch(BSC6900,BSC6910)*** parameter is selected, a blind redirection is preferentially performed as long as conditions for triggering a service-based UMTS-to-LTE redirection are met, even if the UE supports LTE measurement.





Risk:
1. No Blind PS redirection used experiences in HW network.
2. HW suggests to use redirection based on measurement for better redirection success rate.

Fast return for CSFB users without measurements:
HO_CSFB_BASED_MEAS_FAST_RETURN_SWITCH-0 (only for the collocated 3G cells in the re-farmed site)

Fast return without measurements

Proposal (2/2)

2. Fast return for CSFB users without measurements:

For the measurement-based fast return of a CSFB UE after releasing a voice service, there are an RNC-level switch and a cell-level switch. The RNC-level switch is HO_CSFB_BASED_MEAS_FAST_RETURN_SWITCH under HoSwitch1(BSC6900,BSC6910). The cell-level switch is HO_CSFB_BASED_MEAS_FAST_RETURN_SWITCH under FastReturnToLTESwitch(BSC6900,BSC6910). When both the RNC-level and cell-level switches are configured, the setting of the cell-level switch takes precedence. Inorder to apply fast return without measurements, we need to turn the mentioned switch to **OFF (HO_CSFB_BASED_MEAS_FAST_RETURN_SWITCH)**

Considering LTE coverage, SRVCC user can only make fast return based on measurement.

Note: Only for the collocated 3G cells in the re-farmed site:

NBI MO	NBI Parameter ID	Sub-Parameter Name	Vodafone Value
UCELLU2LTEHONCOV	U2LSERVALGOSWITCH	HO_LTE_SERVICE_BLIND_FIRST_SWITCH	ON
UCORRMALGOSWITCH	HOSWITCH1	HO_CSFB_BASED_MEAS_FAST_RETURN_SWITCH	OFF
UCELLHOCOMM	FASTRETURNTOLTESWITCH	HO_CSFB_BASED_MEAS_FAST_RETURN_SWITCH	OFF

MO	NBI Parameter ID	Sub-Parameter Name	Vodafone Value	Sugested value on F1/F2 after refarming F3
UCELLCAC	DlHoCeCodeResvSf	DL handover credit and code reserved SF	SF32 on F1 SF64 on F2	SF32
UCELLCAC	UlNonCtrlThdForOther	UL threshold of other services	60 - F1 70 - F2 &F3	60
UCELLLDM	UlLdrRelThd	UL LDR release threshold	45 - F1 55 - F2 & F3	55
UCELLLDM	UlLdrTrigThd	UL LDR trigger threshold	55 –F1 65 – F2 & F3	65
UCELLALGOSWITCH	HspaPlus Switch_DC_HSPA	Cell DC-HSDPA function switch	OFF – F1 ON - F2 & F3	ON for F1 and F2

Huawei SRAN 2G

Parameter settings for all GSM cells with IRAT neighbour relation to LTE-cell:

Managed Object	CDD Name	Parameter Name	Old Setting	New Setting
GEXTLTECELL	FREQ	EARFCN	LTE800: 6300 LTE1800: 1836 LTE2600: 2850 LTE2100_5MHz: 125 **LTE2100_10MHz: 101**	LTE800: 6300 **LTE1800: 1801** LTE2600: 2850 ~~**LTE2100_10MHz: 101**~~ ~~**LTE2100_10/15MHz: 125**~~ **LTE2100_20MHz: 100** **LTE700: 9460** **LTE900: 3600** **only for GSM cells with co-sited LTE700 / LTE900**
GLTENCELL	NCELLPRI	Neighbouring Cell Priority	7 (LTE 2600) 6 (LTE 1800 20MHz) 5 (LTE2100_10/15MHz) 4 (LTE 700) 3 (LTE 800) 2 (LTE 900)	**6 (LTE2100)** **5 (LTE 2600)** **5 (LTE 1800)** **4 (LTE 800)** **3 (LTE 700)** **2 (LTE 900)** **-> to be changed later**
GCELLPRIEUTRANSYS	THREUTRANHIGH	EUTRAN Cell Resel High THD Based on PRI	5 (10dB)	**4 (8dB)**
GCELLPRIEUTRANSYS	EUTRANQRXLEVMIN	Min RX Level of EUTRAN Cell Based on PRI	7	**7** KLASSE=RURAL: **8**
GCELLPRIEUTRANSYS	EUTRANPRI	EUTRAN Priority	5	**3**

~~GCELLPRIEUTRANSYS~~	~~UTRANPRI~~	~~UTRAN Priority~~	~~3~~	**~~1~~**
GCELLPRIEUTRANSYS	GERANPRI	GERAN Priority	1	**0**
G3GNCELL	NCELLPRI	Neighboring Cell Priority	3	**1**
G2GNCELL	NCELLPRI	Neighboring Cell Priority	DCS1800: 0 GSM900: 1	GSM900: 0

Maximum number of measurement frequencies in 2G:

With introduction of LTE2100 an additional measurement frequency has to be configured. Accordingly the amount of GSM-measurement frequencies has to be reduced by 1.

By introducing LTE700 and LTE900 2 additional measurement frequencies have to be configured in case of cosited LTE700 or LTE900 neighbour cells. Accordingly and based on the local configuration, the amount of GSM-measurement frequencies might be reduced by 2 in maximum.

Max. 32 measurement frequencies – 1 UARFCN – 1 LTE700 EARFCN – 1 LTE800 EARFCN – 1 LTE900 EARFCN – 1 LTE1800 EARFCN - 1 LTE 2600 EARFCN - 1 LTE 2100 EARFCN = max. 25 **measurement frequencies for *GSM***

If 26 measurement frequencies for GSM were used before, at least one GSM neighbour relation need to be deleted in order to be equal or below 25 measurement frequencies.

Complete parameter lists can be found in SharePoint Radio Engineering

https://vodafone.sharepoint.com/sites/radio_engineering/Optimierung

NCCB Approval & additional information:
NCC Approval and additional information can be found in SharePoint Radio Engineering

https://vodafone.sharepoint.com/sites/radio_engineering/Workoder/Workorder%20%20Recommendation%20012013/07%20Workorder%20-%202018/NOWO_2018_31_Huawei_2G_3G_4G%20Layer%20Management

7. Contact person

For any further questions you can contact:
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Mr. Steffen Kutter (TRCO), Tel.: 0172 / 3500050.